Technical Memorandum

Date: January 22, 2007

To: Russell Hunt, Jones & Stokes, San Diego CA

From: James Wilder, P.E., Jones & Stokes

Subject: Revised (January 2007): Noise Study Technical Memorandum for Employee Parking Lot for Valley View Casino
San Pasqual Band of Mission Indian Tribe, Valley Center, California
Project - R04-17; Log No. 04-09-014

Introduction

This revised noise study technical memorandum discusses potential noise impacts associated with construction and operation of the employee parking lot and associated temporary electrical generators at the Valley View Casino in Valley Center, California (Figure 1). This noise analysis was requested by San Diego County in their letter dated September 20, 2004. This revised memorandum updates the original study (dated December 30, 2005) and the June 21, 2006 addendum) to address County comments received on December 8, 2006. The key noise issues evaluated for this study are:

- Noise associated with temporary nighttime operation of the four existing portable generators and streetlamps used to light the parking lot, during the interim period before the electrical generators are replaced with permanent line electrical power.
- Noise caused by employee vehicles and shuttle buses entering and exiting the parking lot from public roads.
- Noise caused by the window air conditioner at the guard shack.

Conclusions

The conclusions of this noise study are as follows:

Noise Compliance Location

To be conservative, this noise study evaluated noise impacts at the closest easement boundary, rather than the actual facility boundary. This is because the property boundary is at the centerline of a busy highway (Valley Center Road), at which location it was impossible to take baseline noise readings.

Noise Sensitive Receivers

Four sets of noise-sensitive receivers were evaluated (Figure 2): 1) the inner easement boundary defined by Valley Center Road on the north, and Lake Wohlford Road on the east, and the property line at Valley Center Middle School on the south; 2) two existing homes on the north side of Valley Center Road (150 feet from the parking lot); 3) the closest recreational area within the Valley Center Middle School (150 feet from the parking lot); and 4) the closest classroom at the Middle School (roughly 400 feet from the parking lot).

Existing Noise Levels are High

Jones & Stokes took 24-hour sequential hourly noise measurements at the northern facility boundary on the south side of Valley Center Road and at the eastern facility boundary on the west side of Lake Wohlford Road. The dominant existing noise sources are high-speed traffic along Valley Center Road and lower-speed traffic on Lake Wohlford Road. Existing peak-hour traffic noise at the northern boundary (along Valley Center Road) is 76 dBA Leq, and the estimated existing peak-hour noise at homes nearest the parking lot (on the north side of Valley Center Road) is estimated to be roughly 72 dBA (peak-hour Leq). Existing 24-hour CNEL noise levels at those homes are estimated to be 73 dBA CNEL. The quietest measured nighttime noise levels at the northern and eastern facility boundaries were 65 dBA Leq and 61 dBA Leq, respectively. Existing peak-hour traffic noise outside the school classroom nearest the parking lot is estimated to be 59 dBA (outdoor Leq).

Peak-Hour Traffic Noise Impacts are Less-than-Significant

The number of employee vehicles entering and exiting the parking lot will be much lower than the number of vehicles currently traveling at high speed along Valley Center Road and Lake Wohlford Road, so the parking lot would cause only a less-than-significant increase in traffic noise at the closest homes and at the adjacent Middle School. Additional parking lot traffic associated with full buildout of the expanded parking lot would cause a net increase in peak-hour traffic noise of only 0.2 to 0.4 dBA (peak-hour Leq) compared to No Action traffic noise levels. Caltrans guidance indicates that traffic noise increases of less than 3 dBA are generally not discernible. Therefore, the small noise increase caused by increased traffic is considered less-than-significant.

24-Hour CNEL Noise Increases Caused by the Parking Lot are Less-than-Significant

24-hour average noise levels caused by employee vehicles and shuttle buses using the new parking lot were estimated using the Federal Transit Administration (FTA) noise spreadsheet (2005). Predicted 24-hour Ldn noise levels at the nearest homes and the nearest school classroom caused solely by vehicles at the parking lot were only 41 dBA and 36 dBA, respectively. Those parking lot noise levels are insignificantly small compared to the background CNEL of 72 dBA at the nearest homes.

Temporary Electrical Generator Noise would be Less-than-Significant

The applicant has already retrofitted each generator with acoustical insulation inside the generator casings. Even during the quietest hour of the night, the noise level at the closest residential property boundary (on the north side of Valley Center Road) caused by temporary operation of the four diesel generators would be less than existing background levels. Therefore, the noise impact caused by the temporary generators would be less-than-significant, and no additional noise mitigation is warranted.

Air Conditioner Noise would be Less-than-Significant. Noise generated by the small air conditioner at the guard shack would be less than background levels at all receivers evaluated for this study.

Project Description

Parking Lot Construction Project

The project is the construction of an approximately 500-space paved parking lot on a portion of an approximately 10-acre site located at the southwest quadrant of Valley Center Road and North Lake Wohlford Road (Figure 1). Access to the parking lot would be taken from Valley Center Road via the frontage road used by the Middle School for bus loading and unloading. No additional driveways or intersections will be created along Valley Center Road. Employees will exit the parking lot to Valley Center Road via the School Bus Road or to North Lake Wolford Road via the right-turn-only exit. No phasing is proposed.

The project site is owned “in fee” by the San Pasqual Band of Mission Indians. It is adjacent to the athletic fields of Valley Center Middle School and approximately one-quarter mile north of the Valley View Casino. The County of San Diego has land use jurisdiction for the site and has required the property to be rezoned from A70 to S86 to allow the site to be used for parking. The parking lot would be used primarily by employees working for Valley View Casino, with occasional use during special events at Valley Center Middle School, and by various community athletic organizations that use the facilities, such as Pop Warner Football, Valley Center Little League, and the American Youth Soccer Organization. The Middle School and community athletic organizations have used the unimproved site to park cars for many years. Employees of the Casino would be transported to the Casino by shuttle bus.

Temporary Parking Lot Lighting

The existing parking lot is illuminated by four portable, modular streetlamps and generator sets, which have already been retrofitted for quiet operation. Technical specifications for the generators and streetlamps are provided in Appendix A. Each streetlamp is powered by a 13-hp portable diesel electrical generator. Figure 1 shows the location of each generator set. As shown in Figure 1, the generators will be installed at the following distances compared to the regulatory compliance points for the County noise limits:

- Closest generator to property line (centerline of Valley Center Road): 130 feet
- Closest generator to easement (south side of Valley Center Road): 80 feet

Air Conditioner at Guard Shack

A one-room modular guard shack will be used at the parking lot. A small air conditioner will be used to cool the shack. For purposes of estimating noise impacts, the air conditioner was assumed to be the equivalent of a 7,000 Btu/hour LG Electronics Model LWHD7000HR window-mounted unit. The manufacturer of that unit indicates a source noise emission level of 54 dBA at a 5-foot reference distance. Specifications for a representative window air conditioner are provided in Appendix G.

Surrounding Land Use and Sensitive Receptors

Figure 2 is an aerial photograph that shows the existing parking lot and the surrounding land use relevant to the noise impact analysis. The parking lot itself is proposed to be zoned for S86, Parking. The site is bordered on the north by Valley Center Road, a high-speed arterial. The properties north and west of the parking lot are zoned A70, Limited Agriculture. One existing home and one commercial business are on the north side of Valley Center Road across from the parking lot; these are designated as noise sensitive receivers R-1 and R-2. The Valley Center Middle School is south of the parking lot. Basketball courts and other athletic fields are adjacent to the parking lot; Receiver R-3 represents the basketball courts closest to the parking lot. The closest classrooms at the school are a considerable distance away; Receiver R-4 represents the closest classroom, 400 feet from the existing parking lot.

The hourly average noise limits specified by the County noise ordinance apply at the facility boundary. Three boundary-line receivers were used to demonstrate compliance with the County ordinance: R-5 at the east boundary along Lake Wohlford Road; R-7 at the north boundary along Valley Center Road; and R-8 at the southern boundary adjacent to the Middle School.

Forecast Traffic Volumes Generated by Parking Lot Users

Existing traffic volumes and forecast future volumes were obtained from the proponent's traffic consultant Linscott, Law and Greenspan (LLG, 2006). Diagrams showing existing and future

traffic volumes and traffic patterns are provided in Figure 3 and Appendix B. The parking lot will be used only by two sets of vehicles.

- Passenger cars driven by workers from the Valley View Casino. These workers will be shuttled from the parking lot to the casino using small shuttle buses. The shuttle buses will not park at the new parking lot; they will park at the casino's main parking lot. Large passenger buses will not use the new parking lot.
- Passenger cars driven by participants and viewers attending athletic events at the Middle School. School buses and athletic team buses will not park at the new parking lot.

Figure 3 shows the existing Annual Average Daily Traffic (AADT), existing peak-hour traffic volumes, and the projected future traffic volumes generated by the parking lot (Linscott Law & Greenspan, 2006).

As shown in Figure 3 and Appendix B, the estimated baseline AADT along Valley Center Road (without Valley View Casino employees) is 7,700 vehicles per day, while the "With Project" AADT (including Valley View Casino employees) is 9,880 vehicles per day. The difference between the Baseline AADT and "With-Project" AADT value is 2,180 vehicles per day. Therefore, it is estimated employees and shuttle buses traveling to and from the new parking lot would generate an average of 2,180 vehicle trips per day along Valley Center Road. Similarly, the traffic forecasts in Appendix B show employee and shuttle bus traffic contributes and AADT of 980 vehicles per day along Lake Wohlford Road between the parking lot and the casino. Note that most of these would not be new vehicle trips, but they are the trips already generated by employees traveling to and from the casino. The proposed project would simply shift the location at which the employees park after they reach the casino.

Vehicle trips generated by casino employees would not be evenly distributed during the day. The approximate distribution of employment by daily work shift is as follows:

Regular shift (7 a.m. to 5 p.m.)	50%
Swing shift (5 p.m. to Midnight)	35%
Late shift (Midnight to 7 a.m.)	15%

Figure 3 shows the peak morning hour vehicle trips after the parking lot is constructed. The Traffic Impact Analysis Report derived peak-hour trip generation for the proposed 500-space lot based on field measurements taken at the existing 200-space lot. The forecast peak hourly employee vehicle trips entering and exiting Valley Center Road are not necessarily distributed according to the shift schedule fractions listed above. There are 12 categories of staff at the casino, and not all of the categories follow the above shift schedule. In addition, the morning "peak period" typically lasts for several hours, so the maximum peak-hour traffic volumes reflect that broad period. Furthermore, the maximum hourly number of employee vehicle trips during any shift change would be attenuated by the need for employees to travel to the parking lot via shuttle buses. As shown on Figure 3, the peak-hour traffic volumes generated by the proposed

parking lot will be much lower than the current traffic volumes along Valley Center Road and Lake Wohlford Road.

Noise Fundamentals

The following is a brief discussion of fundamental noise concepts. For a detailed discussion, please refer to the *Technical Noise Supplement* (California Department of Transportation, Caltrans 1998b), which is available on their Web site (http://www.dot.ca.gov/hq/env/).

Sound Pressure Levels and Decibels

The amplitude of a sound determines its loudness. Loudness of sound increases and decreases with increasing and decreasing amplitude. Sound-pressure amplitude is measured in units of micro-newtons per square meter (N/m^2), also called micro-pascals (uPa). One uPa is approximately one hundred billionth (0.00000000001) of normal atmospheric pressure. The pressure of a very loud sound may be 200 million u Pa, or 10 million times the pressure of the weakest audible sound (20 uPa). Because expressing sound levels in terms of uPa would be cumbersome, sound pressure level (SPL) is used to describe in logarithmic units the ratio of actual sound pressures to a reference pressure squared. These units are called bels, named after Alexander Graham Bell. To provide finer resolution, a bel is divided into 10 decibels (dB).

Addition of Decibels

Because decibels are logarithmic units, SPL cannot be added or subtracted by ordinary arithmetic means. For example, if one automobile produces an SPL of 70 dB when it passes an observer, two cars passing simultaneously would not produce 140 dB; rather, they would combine to produce 73 dB. When two sounds of equal SPL are combined, they produce a combined SPL 3 dB greater than the original individual SPL. In other words, sound energy must be doubled to produce a 3-dB increase. If two sound levels differ by 10 dB or more, the combined SPL is equal to the higher SPL; the lower sound level would not increase the higher sound level.

A-Weighted Decibels

The A-scale weighting network approximates the frequency response of the average young ear when listening to most ordinary sounds. When people make judgments of the relative loudness or annoyance of a sound, their judgments correlate well with the A-scale sound levels of those sounds. Noise levels for traffic noise reports are typically reported in terms of A-weighted decibels (dBA). In environmental noise studies, A-weighted SPLs are commonly referred to as noise levels. Table 1 shows typical A-weighted noise levels.

Table 1. Typical Noise Levels

Common Outdoor Activities	Noise Level (dBA)	Common Indoor Activities
	— 110 —	Rock band concert
Jet fly-over at 300 meters (1000 feet)		
	— 100 —	
Gas lawn mower at 1 meter (3 feet)		
	— 90 —	
Diesel truck at 15 meters (50 feet) at 80 kph (50 mph)		Food blender at 1 meter (3 feet)
	— 80 —	Garbage disposal at 1 meter (3 feet)
Noisy urban area, daytime		
Gas lawn mower, 30 meters (100 feet)	**— 70 —**	Vacuum cleaner at 3 meters (10 feet)
Commercial area		Normal speech at 1 meter (3 feet)
Heavy traffic at 90 meters (300 feet)	**— 60 —**	
		Large business office
Quiet urban daytime	**— 50 —**	Dishwasher next room
Quiet urban nighttime	**— 40 —**	Theater, large conference room (background)
Quiet suburban nighttime		
	— 30 —	Library
Quiet rural nighttime		Bedroom at night
	— 20 —	
		Broadcast/recording studio
	— 10 —	
Lowest threshold of human hearing	**— 0 —**	Lowest threshold of human hearing

Source: Caltrans 1998b.

Noise Descriptors

Noise in our daily environment fluctuates over time. Some fluctuations are minor, but some are substantial. Some noise levels occur in regular patterns, but others are random. Some noise levels fluctuate rapidly, but others slowly. Some noise levels vary widely, but others are relatively constant. Various noise descriptors have been developed to describe time-varying noise levels. The following noise descriptor is commonly used in traffic noise analysis.

- **Equivalent Sound Level (L_{eq}):** L_{eq} represents an average of the sound energy occurring over a specified period. In effect, L_{eq} is the steady-state sound level that in a stated period would contain the same acoustical energy as the time-varying sound that actually occurs during the same period. The 1-hour, A-weighted equivalent sound level (L_{eq}[h]) is the energy average of the A-weighted sound levels occurring during a 1-hour period, and is the basis for the traffic noise analysis and the stationary generator noise analysis used for this report.
- **24-hour Average Community Noise Equivalent Level (CNEL) and Day-Night Noise Level (Ldn)**: The day-night noise level (Ldn) is the 24-hour average Leq, with a 10-dBA penalty added to nighttime noise levels (10:00 pm to 7:00 am). The CNEL is also a 24-hour average Leq, with a 5 dBA penalty added for evening hours (7:00 pm to 10:00 pm) and a 10 dBA penalty added to nighttime hours (10:00 pm to 7:00 am).
- **Percentile Noise Level (Lnn)**: The Percentile Noise level is used to quantify time-varying noise levels. The Percentile Level Lnn is the noise level that is exceeded for "nn" percent of the measurement period. For example, the L10 is a relatively loud noise level that is exceeded only 10 percent of the time, while the L90 is a relatively quiet noise level that is exceeded 90 percent of the time.

Sound Propagation

When sound propagates over a distance, it changes in level and frequency content. The manner in which noise reduces with distance depends on the following factors.

- **Geometric Spreading:** Sound from a small, localized source (i.e., a point source) radiates uniformly outward as it travels away from the source in a spherical pattern, resulting in an attenuation (dropping off) rate of 6 dBA for each doubling of distance. For highways, where the movement of the vehicles on a roadway makes the source of the sound appear to emanate from a line (i.e., a line source) rather than a point, noise attenuates at a rate of 3 dBA per doubling of distance. This is because a line source results in cylindrical spreading rather than the spherical spreading that results from a point source.
- **Ground Absorption:** The noise path between the highway and the observer is usually very close to the ground. Noise attenuation from ground absorption and reflective-wave canceling adds to the attenuation associated with geometric spreading. No excess ground attenuation is assumed for acoustically hard sites (i.e., those sites with a reflective surface), while acoustically absorptive or soft sites (i.e., those sites with an absorptive ground surface) are assumed to result in an attenuation rate of about 1.5 dBA per doubling of distance. When added to the geometric spreading, the excess ground attenuation results in an overall drop-off rate of about 4.5 dBA per doubling of distance for a line source and about 7.5 dBA per doubling of distance for a point source.
- **Shielding by Natural or Human-Made Features:** A large object or barrier (i.e., hills, dense woods, buildings, and walls) in the path between a noise source and a receiver can substantially attenuate noise levels at the receiver, depending on the size of the object and the

frequency content of the noise source. A barrier that breaks the line of sight between a source and a receiver will typically result in at least 5 dB of noise reduction. A taller barrier may provide as much as 20 dB of noise reduction.

Human Perception of Noise Increases

- People generally perceive a 10 dBA increase in a noise source as a doubling of loudness. For example, an average person would perceive a 70 dBA sound level as being twice as loud as a 60 dBA sound. People generally cannot detect differences of less than 1 to 2 dBA between noise levels of a similar nature (e.g., an increase in traffic noise compared to existing traffic noise). However, under ideal listening conditions, some people can detect differences of as little as 2 or 3 dBA (Caltrans, 1998b). Most people under normal listening conditions would probably perceive a 5 dBA change in sounds of a similar nature. Note that when the new sound is of a different nature than the background sound (e.g., backup alarms compared to quiet residential sounds), most people can detect changes as low as 1 dBA.

San Diego County Noise Ordinance, County Noise Element, and Significance Thresholds

County Noise Ordinance

The San Diego County Noise Ordinance (Title 3, Chapter 4, Noise Abatement and Control) specifies allowable noise limits for temporary construction activity and permanent operations at commercial and industrial facilities.

Construction noise is regulated under Section 36.410, Construction Equipment. Commercial construction is prohibited on Sundays and holidays, and is also prohibited during evening and nighttime hours (between 7 p.m. and 7 a.m.). For daytime commercial construction, the ordinance sets noise limits as follows: "It shall also be unlawful to operate any construction equipment so as to cause at or beyond the property line of any property on which a legal dwelling unit is located an average sound level greater than 75 decibels between the hours of 7 a.m. to 7 p.m."

Section 36.404, Sound Level Limits, regulates allowable noise limits caused by long-term commercial operations. These noise limits, which apply at the emitting facility boundary, apply to the temporary streetlamp generators. Allowable noise limits are set for each zoning category. Table 2 lists the allowable limits for S86 zoning (the proposed zoning for the parking lot) and A70 zoning (the zoning for the surrounding parcels). The applicable noise limits for the temporary generators are the arithmetic average of the allowable limits for S86 zoning and A70 zoning. If the existing background noise level is already higher than the specified limits, then the applicable limit at the property boundary is the existing background level. Note that, as described later in this report, the background noise levels at the project site are already considerably higher than the allowable limits listed in Table 2. Therefore, the existing background levels govern the allowable noise levels for this project.

Table 2. Allowable Noise Limits for Temporary Generators

Zoning	Daytime Limit (1-hour average Leq)	Nighttime Limit (1-hour average Leq)
S86 (Proposed future zoning of parking lot)	55 dBA	50 dBA
A70 (Existing zoning of adjacent parcels)	50 dBA	45 dBA
Allowable limit at facility boundary (average of limits for S86 and A70 zoning)	52.5 dBA	47.5 dBA

Notes:
1. Limits apply at emitting property boundary
2. If the existing background noise level is already higher than the specified limits, then the applicable limit at the property boundary is the existing background level.

Traffic Noise Guidelines from County Noise Element

The County noise ordinance does not regulate traffic noise from vehicles on public streets, but the Noise Element (Part VIII of the County General Plan) acknowledges that major increases in traffic noise along public roads can cause significant noise impacts. The Noise Element characterizes traffic noise impacts according to increases in the Community Noise Equivalent Level (CNEL). According to County guidance provided in the County First Review of Initial Studies, the following is relevant to identify potential impacts due to traffic noise increases:

> With an existing CNEL of 60 dBA or more, a net increase of 3 dBA CNEL due to the project would be considered as potentially significant. For quieter areas with an existing CNEL less than 49 dBA, a net increase of 10 or more dBA CNEL due to the project would also be considered potentially significant.

As described later in this report, the existing homes along heavily used Valley Center Road already experience CNEL exceeding 60 dBA. In their case the County guidance considers a traffic noise increase of more than 3 dBA CNEL to constitute a significant noise impact.

Significance Thresholds for Noise Impacts

For this analysis, a modeled noise level would be significant if it triggered any of the following criteria:

- Construction activity causing 1-hour average daytime noise levels exceeding County noise ordinance limits (75 dBA Leq at the property line of adjoining residential property or at school classrooms).

- Electrical generator operation causing 1-hour average noise levels at the facility boundary exceeding the quietest existing nighttime background noise levels (65 dBA nighttime background along Valley Center Road, and 61 dBA nighttime background along Lake Wohlford Road). At the County's direction the compliance point along Valley Center Road is assumed to be the property line easement on the north side of the road, 30 feet north of the roadway centerline.
- Increase in parking lot noise exceeding 3 dBA CNEL above background at any of the residential receivers or Middle School classrooms.
- Increase in peak-hour traffic noise exceeding 3 dBA (1-hour Leq) at any of the residential receivers caused by increased traffic volumes on public roads (Valley Center Road and Lake Wohlford Road).
- Daytime noise levels high enough to cause indoor noise levels at the nearest school classroom to exceed 50 dBA (1-hour Leq).

Study Methods and Procedures

Compliance Point: Easement Boundary vs. Property Line

The County noise limits apply at the property line, which are the centerlines of Valley Center Road and Lake Wohlford Road. However, for this analysis, the baseline noise levels and the project-related noise impacts were applied at the easement boundaries inside the actual property lines. This provides a conservative estimate of noise impacts caused by the Project, for the following reasons:

- Baseline noise measurements taken at the easement boundaries (50 feet from the roadway centerlines) are much lower than the noise levels that would have occurred at the roadway centerlines, if it had been safe to take 24-hour readings at the roadway centerlines.
- The easement boundaries used as the compliance points are closer to the Project-related noise sources, so the predicted noise levels at the compliance points are conservatively high.

Background Noise Monitoring

At the County's request, Jones & Stokes conducted two 24-hour long monitoring rounds to measure sequential hourly background noise levels at the northern easement boundary (on the south side of Valley Center Road) and the eastern easement boundary (on the west side of Lake Wohlford Road). The objectives of the measurements were to measure existing CNEL noise levels at the nearest homes north of Valley Center Road, and to measure the quietest nighttime hour at the facility boundary for purposes of regulating noise from the temporary diesel generators. The baseline measurements along Valley Center Road were taken at location SLM-1 shown on Figure 2, at the southern easement 50 feet south of the roadway centerline. The SLM-1 measurements were taken on Wednesday–Thursday, June 14–15, 2006. The baseline

measurements along Lake Wohlford Road were taken at location SLM-2 shown on Figure 2, at the western easement 30 feet west of the roadway centerline. The SLM-2 measurements were taken on Friday–Saturday, June 16–17, 2006.

All noise measurements were taken using a Larson-Davis Model 720 noise meter, set for A-weighted decibels and "slow" averaging time, and set to record 1-hour intervals. The monitor was mounted onto signposts or telephone poles with the microphone 5 feet above road level. The noise monitor was calibrated before and after the noise monitoring using a Larson-Davis CA-250 calibrator.

Construction Noise Assessment

The existing parking lot has already been constructed. Construction of the expanded parking lot will be straightforward, and will require conventional construction equipment, including bulldozers, graders, excavators, roller compactors, and paving equipment. All construction activity will be done during the daytime, in accordance with the County noise ordinance.

Noise levels generated by the conventional construction activities were estimated using generalized construction noise profiles for construction operations compiled by the City of Los Angeles for their CEQA Thresholds Guide (City of Los Angeles 1998). The loudest activity during the construction would likely be site grading. The typical noise level caused by the combined construction equipment during site grading and excavation is 86 dBA at a 50-foot reference distance. The daytime construction noise levels at each of the noise-sensitive receivers were estimated using that source reference level, and assuming the noise levels would attenuate with distance solely by hemispherical wave spreading, at an attenuation rate of 6 dBA per doubling of distance.

L_{dn}/CNEL Parking Lot Noise Modeling

Low-speed traffic noise (expressed as the Ldn) caused by parking lot operations was estimated using the "Park and Ride" module of the Federal Transit Administration's General Noise Assessment Spreadsheet (FTA 2005). As shown in Appendix B, 2,180 employee vehicles per day are forecast to use the parking lot. The employees will use the lot for three work shifts throughout the day, so for purposes of modeling the 24-hour Ldn, the average hourly traffic volume using the parking lot was modeled as 91 cars per hour distributed over the entire day and night (2,180/24 = 91 cars per hour). Copies of the FTA parking lot noise spreadsheets are provided in Appendix C.

Peak-Hour Traffic Noise Modeling

Peak-hour traffic noise levels were modeled using the Federal Highway Administration's Traffic Noise Model Version 2.5 (TNM). TNM modeling output files are provided in Appendix C. Peak-hour traffic volumes for the existing condition and the full-buildout condition (shown in Figure 3) were used for the traffic noise modeling. Traffic along Valley Center Road and Lake

Wohlford Road was assumed to include 1 percent heavy trucks and 1 percent medium trucks, based on manual traffic counts taken at the site during reconnaissance in June 2005. Traffic along the parking lot access roads was assumed to consist solely of passenger cars. Traffic was assumed to travel at the posted speed limit along Valley Center Road (55 mph) and Lake Wohlford Road (30 mph). Traffic on Lake Wohlford Road was assumed to be controlled by a stop sign. Vehicles traveling along School Bus Road between the parking lot and the school were assumed to travel at 20 mph. For the TNM modeling the site was assumed to be level, with no terrain obstructions between the roadways and the noise-sensitive receivers.

Portable Diesel Generator Noise Measurements

The existing parking lot is currently illuminated by four portable Magnum Industries Model MLT4060 streetlamp/generator sets. Technical specifications for these streetlamps are provided in Appendix A. The applicant acoustically retrofitted the four generator sets in August 2005 to reduce their noise emissions. The acoustical retrofit was done by installing acoustical cladding inside each generator's weatherproof cabinet. Noise measurements were taken before and after the retrofit of a representative generator, and are described in Table 3. The generator monitoring was limited to dBA noise levels. No attempt was made to measure frequency spectra.

Table 3. Noise Emissions from Generator Sets

Orientation Relative to Generator	Noise Level (dBA) Measured 50 feet from Generator	
	Before Acoustical Retrofit	After Acoustical Retrofit
Front	60.3	56.8
Right	61.7	56.8
Rear	64.9	61.3
Left	61.3	56.8
Average of 4 sides	62.1	57.9
Maximum Value	64.9	61.3
Note: Background noise levels during the generator monitoring ranged from 44-45 dBA.		

The noise levels at each noise-sensitive receiver caused by simultaneous operation of the four generators were modeled using the Community Noise Model Version 6.2 (CNM6.2) developed by the University of Central Florida noise laboratory (University of Central Florida, 2004). CNM 6.2 input assumptions and modeling results are provided in Appendix E. The CNM model is non-proprietary “freeware” distributed by the University of Central Florida. It uses sound

propagation algorithms derived from the International Standards Organization (ISO) Standard 9613-2, Attenuation of Sound During Propagation Outdoors. The model accounts for noise attenuation by hemispherical wave spreading, atmospheric absorption, ground absorption, and man-made noise barriers. In accordance with that ISO 9613.2 standard, the CNM6.2 model presents modeled noise levels as dBA, assuming all sources operate at a sound frequency of 500 Hz. The model then calculates atmospheric absorption, ground loss, and barrier attenuation based on that 500 Hz frequency.

For this analysis, it was assumed the entire study area is level, with no terrain obstacles between the electrical generators and the noise-sensitive receivers. This simplifying assumption results in conservatively high modeled noise levels, because in reality the homes on the north side of Valley Center Road are lower in elevation than the generators and might be partially shielded by the Valley Center Road embankment. For this analysis the CNM6.2 model calculated noise levels for both "hard ground" and "soft ground." Both sets of modeling results are presented in this report, but the compliance determination relied only on the conservatively high "hard ground" modeling results.

Baseline Noise Readings

Baseline Noise Monitoring at Easement Boundaries

Table 4 lists the results of the sequential-hourly baseline noise monitoring conducted at the northern easement boundary (location SLM-1 on the south side of Valley Center Road) and the eastern easement boundary (location SLM-2 on the west side of Lake Wohlford Road). The 24-hour average CNEL values are also listed at the bottom of the table for each monitoring location. Additional monitoring data for other sequential-hourly noise parameters (L10 and L-90) are provided in Appendix F.

As shown in Figure 1 the actual facility boundary is near the centerlines for Valley Center Road and Lake Wohlford Road. Thus, the compliance point for the County noise limits is the centerline of those roads. However, baseline noise readings could not be taken safely at those locations, so instead they were taken at the easement boundaries. Therefore, the measured noise levels (at the easement boundary) represent conservatively low background values compared to the actual levels at the property line (at the roadway centerlines).

Table 4. Measured Baseline Noise Levels at Valley View Casino Parking Lot

Start Time	Measured Leq at Easement Boundaries, dBA	
	SLM-1 Easement Boundary 50 ft South of Valley Center Road Centerline	SLM-2 Easement Boundary 30 ft West of Lake Wohlford Road Centerline
Midnight	69	62
1:00 a.m.	67	63
2:00	66	61
3:00	65	61
4:00	66	63
5:00	70	65
6:00	73	65
7:00	74	70
8:00	76	66
9:00	73	66
10:00	73	67
11:00	73	67
12:00 Noon	74	74
13:00	74	67
14:00	74	68
15:00	74	66
16:00	74	64
17:00	73	67
18:00	73	66
19:00	74	66
20:00	72	70
21:00	74	64
22:00	71	65
23:00	70	64
24-Hour CNEL, dBA	77	71
Minimum Hourly Leq, dBA	65	61

Location SLM-1 was at the southern easement 50 feet south of Valley Center Road, but the noise levels measured there are presumed to be similar to those along the northern easement (30 feet

from the road), which is the County's compliance point for noise emissions from the temporary electrical generators. The quietest noise level at SLM-1 (65 dBA Leq) occurred at 03:00 a.m.

Location SLM-1 was 50 feet south of the Valley Center Road centerline, while the closest home (Receiver R-1) is 60 feet north the centerline. That home is also down slope from the road and may be partially shielded by the topography. Based on Jones & Stokes' professional judgment it was assumed the baseline noise level at Receiver R-1 is 3 dBA lower than the measured noise at SLM-1. In that case, the assumed baseline levels at Receiver R-1 are 74 dBA (CNEL) and 62 dBA (quietest nighttime level).

Spot-Check Noise Reading for TNM Model Validation

A spot-check 15-minute baseline noise reading was taken at the site on June 1, 2005. The objective of the spot-check noise reading was to generally evaluate the existing noise environment at the site, and to collect data with which to validate the TNM noise model used to predict traffic noise. Noise readings were taken roughly 50 feet north of the edge of Valley Center Road, at a location corresponding to the two homes nearest the parking lot. Noise readings were taken with a tripod-mounted noise meter (Larson-Davis Model 700), which was calibrated at the site immediately before and after the measurements. Weather conditions were ideal for noise measurements: warm and sunny, with calm winds.

The validation site was 30 feet from the edge of Valley Center Road and 400 feet from the intersection with Lake Wohlford Road. Cars traveling on Lake Wohlford Road were visible from the validation site but were not audible. Therefore, it was presumed the measured noise levels at the validation site were caused solely by vehicles traveling on Valley Center Road.

Simultaneous noise measurements and manual traffic counts were taken for 15 minutes. Noise data sheets are provided in Appendix G. Table 5 summarizes the results of the noise readings.

Table 5. Summary of Noise Measurements along Valley Center Road

Noise Parameter	Measured 15-Minute Value (dBA)
Leq	69.9
Lmax	87.5
Lmin	46.5
L2	79.5
L8	73.0
L25	68.5
L90	51.0
Noise Observations: Passing cars (westbound): 72–73 dBA Passing cars (eastbound): 66 dBA Generator noise during periods of no traffic: 48 dBA 15-minute Traffic Counts: Eastbound: C = 77, MT = 1, HT = 1 Westbound: C = 67, MT = 3, HT = 1, MC = 3 Measured Traffic Spe`eds: Westbound: 37–51 mph Eastbound:42–49 mph	

Construction Noise Impacts

As described in this section, construction noise impacts would be less-than-significant. The existing parking lot has already been constructed. Construction of the expanded parking lot will be straightforward and will require conventional construction equipment, including bulldozers, graders, excavators, roller compactors, and paving equipment. All construction activity will be done during the daytime, in accordance with the County noise ordinance.

The loudest activity during the construction would likely be site grading. According to data compiled by the City of Los Angeles, the typical noise level caused by the combined construction equipment during site grading and excavation is 86 dBA at a 50-foot reference distance (City of Los Angeles, 1998). The daytime construction noise levels at each of the noise-sensitive receivers were estimated using that source reference level, and assuming the noise levels would attenuate with distance solely by hemispherical wave spreading, at an attenuation rate of 6 dBA per doubling of distance. Based on those assumptions, the modeled daytime construction noise levels at each receiver are listed in Table 6.

Table 6. Estimated Construction Noise Levels during Site Grading

Receiver	Distance from Construction Zone	Source Noise Level	Modeled Noise Level at Receiver (1-Hour Leq, dBA)
R1 - Western house across Valley Center Road	400 feet	86 dBA at 50 foot distance	68 dBA
R2 - Commercial business across Valley Center Road	550 feet	86 dBA at 50 foot distance	65 dBA
R3 - Basketball courts closest to parking lot	280 feet	86 dBA at 50 foot distance	71 dBA
R4 - School classrooms closest to parking lot	400 feet	86 dBA at 50 foot distance	68 dBA

As shown in Table 6, the modeled worst-case construction noise levels at each receiver are less than the 75 dBA construction noise limit imposed by the County noise ordinance. Therefore, it is concluded the construction noise impacts would be less-than-significant.

Peak-Hour Traffic Noise Modeling Results

As described in this section, modeled increases in peak-hour traffic noise would be less-than-significant.

Validation of TNM Noise Model

The TNM traffic noise model was validated based on simultaneous 15-minute noise measurements, manual traffic counts, and radar gun speed measurements taken at the site on June 1, 2005 (see Table 4). The TNM validation modeling output reports are provided in Appendix G.

The validation site was 30 feet from the edge of Valley Center Road and 400 feet from the intersection with Lake Wohlford Road. Cars traveling at low speed on Lake Wohlford Road were visible from the validation site but were not audible. Therefore, it was presumed the measured noise levels at the validation site were caused solely by vehicles traveling on Valley Center Road. The TNM validation focused solely on Valley Center Road. No manual traffic counts and radar gun speed measurements were taken for low-speed vehicles on Lake Wohlford Road, and the TNM validation-modeling run did not include any vehicles on Lake Wohlford Road.

The validation results for vehicles traveling on Valley Center Road were as follows:

Measured Leq:	69.9 dBA
TNM Modeled Leq:	67.7
Adjustment Factor:	2.2 dBA under-prediction

The 2.2 dBA adjustment factor was added to all peak-hour traffic noise levels modeled by TNM for this project.

Modeled Increase in Peak-Hour Traffic Noise

Traffic noise impacts caused by vehicles traveling along Valley Center Road, Lake Wohlford Road, and School Bus Drive were evaluated by comparing the peak-hour traffic noise levels under existing conditions with those generated after full buildout. A peak-hour increase of 3 dBA or more would trigger a significant traffic noise impact.

TNM modeling reports are provided in Appendix D. Table 7 shows the modeled peak-hour traffic noise levels at each noise-sensitive receiver, for the existing condition and the full-buildout condition.

Table 7. Traffic Noise Levels: With and Without Employee Trips

Receiver	Modeled Peak-Hour Traffic Noise (1-Hour Leq, dBA)		
	Year 2005, Background Without Employee Trips	Year 2005 With Employee Trips	Net Increase
R1 - Western house across Valley Center Road	67.3	67.7	0.4
R2 – Commercial business across Valley Center Road	71.4	71.7	0.3
R3 - Outdoor basketball courts closest to parking lot	61.7	61.9	0.2
R4 - School classrooms closest to parking lot (exterior noise)	57.7	58.0	0.3
Note: Listed peak-hourly values include a 2.2 dBA adjustment factor.			

As listed in Table 7, the modeled Leq traffic noise increases are low, ranging from only 0.2 dBA to 0.4 dBA. The modeled peak-hour increases are much lower than the 3 dBA significance threshold, so it is unlikely the traffic noise increases would be discernible compared to background levels. Therefore, traffic noise impacts caused by vehicles traveling along Valley Center Road, Lake Wohlford Road, and School Bus Road are considered to be less-than-significant.

24-Hour Average Noise Increases Produced by Cars within Parking Lot

As described in this section, noise caused by cars and vans within the parking lot would be less-than-significant. Cars and shuttle vans operating within the parking lot could potentially increase

the 24-hour average CNEL and Ldn at the nearest homes and school classrooms. A CNEL noise increase exceeding 3 dBA would be considered a significant impact. However, as described herein the CNEL increase would be less-than-significant. The analysis was done using a two-step process: 1) estimate the existing background CNEL traffic noise at the nearest homes and classrooms using the Federal Highway Administration methodology; and 2) estimate future Ldn noise levels caused by cars within the parking lot.

Estimated Background CNEL Traffic Noise

Table 8 lists the assumed baseline CNEL noise levels at representative receivers near the proposed parking lot. The baseline CNEL noise levels were derived from the 24-hour baseline measurements taken at location SLM-1 along the northern easement boundary, 50 feet from the centerline of Valley Center Road. The existing homes north of Valley Center Road are 60 feet from the centerline and slightly downhill from the road, so it was assumed the CNEL noise levels at the houses are 3 dBA less than the CNEL measured at the facility boundary on the south side of the road. Based on that assumption, the CNEL levels at the closest homes is 74 dBA. The closest school classroom is 750 feet south of Valley Center Road. The baseline CNEL at the classroom was estimated by applying the "4.5 dBA per doubling of distance" attenuation rule to the measured noise level from location SLM-1. That assumption results in 18 dBA of attenuation between Valley Center Road and the classrooms, in which case the assumed exterior CNEL noise level at the classrooms is 59 dBA.

Table 8. Modeled CNEL Background and Future Parking Lot Noise Levels

Receiver	Measured/Modeled Background Noise from High-Speed Traffic on Valley Center Road (dBA CNEL)	Modeled Noise Solely from Proposed New Parking Lot (dBA Ldn)
Home and commercial building on north side of Valley Center Road (R-1 and R-2)	74	41
Exterior of school classroom nearest the parking lot (R-4)	59	36

Estimated Future Parking Lot Traffic Noise

2,180 vehicles per day (or an average of 91 cars per hour) will use the parking lot. The FTA General Noise Assessment Spreadsheet was used to estimate the 24-hour Ldn noise levels at Receiver R-1 (closet home north of Valley Center Road, 250 feet from the parking lot center) and Reciever R-4 (nearest classroom, 500 feet south of the parking lot) generated by the low-speed traffic using the parking lot. Copies of the FTA spreadsheet are provided in Appendix C. 24-

hour Ldn noise levels were modeled for distances corresponding to the distance between the receiver and the center of the fully developed parking lot.

Table 8 compares the modeled 24-hour background noise levels and the modeled future 24-hour parking lot noise levels. Note the table compares Ldn values for the parking lot with CNEL values for the background roadway noise. CNEL and Ldn values are generally close in value, so the comparison is valid. The modeled parking lot noise levels are 23–33 dBA less than the modeled background noise levels. Therefore, the parking lot noise would be less-than-significant.

Temporary Diesel Generator Noise Impacts

As described in this section, the modeled nighttime noise levels at the nearest easement boundaries caused by the temporary generators are less than the quietest nighttime baseline noise levels that define allowable County noise ordinance limits. Therefore, noise caused by the temporary diesel generators would be less-than-significant.

Nighttime Background Noise Along Easement Boundaries

The lowest nighttime background noise levels along the northern and eastern easement boundaries caused by nighttime traffic along Valley Center Road and Lake Wohlford Road were measured at the request of the County. The quietest measured nighttime noise levels are provided in TNM modeling reports Appendix D. Modeled nighttime background noise levels are as follows:

Northern Easement Boundary (50 feet south of Valley Center Road)	65 dBA L_{eq}
Eastern Easement Boundary (30 feet west of Lake Wohlford Road)	61 dBA L_{eq}
Southern Boundary (400 feet south of Valley Center Road)	52 dBA L_{eq} (estimated)

Modeled Generator Noise and Air Conditioner Noise without Special Enclosures

As described in this section, the noise produced by the temporary electrical generators would be less-than-significant. The existing parking lot uses four modular streetlamp/generator sets for illumination. Figure 1 shows the location of each streetlamp/generator set relative to the noise-sensitive receivers. Each set includes a 13-hp portable diesel electric generator. Technical specifications are provided in Appendix A. As described previously, each of the generators has already been acoustically retrofitted for quiet operation by installing acoustical insulation inside the casing.

The existing temporary guard shack includes a wall-mounted air conditioner that does not currently operate. The proposed new guard shack will include a replacement air conditioner that might operate at night. The air conditioner on the new guard shack will be mounted on the south side of the building facing away from the nearest homes along Valley Center Road. This

orientation will prevent any noise impacts to those homes. Therefore, the proposed new air conditioning unit was not included in predictive noise modeling.

The nighttime noise levels at each noise-sensitive receiver caused by simultaneous operation of the four streetlamp/generator sets were modeled using the CNM6.2 noise model. The measured source noise level for each retrofitted generator set is 57.9 dBA at a 50-foot reference distance. Modeling parameters for the CNM6.2 modeling are listed in Appendix F. As a conservative step all of the modeling receivers were assumed to be "hard ground," which maximizes the modeled noise levels at the receivers. Furthermore, the CNM6.2 model assumed no attenuation caused by topography between the sources and the receivers.

A range of generator noise impacts was modeled. The low end of the range represented a condition where the noise emission from each generator is 57.9 dBA at 50 feet (the average of the measured noise levels in each direction around an actual operating generator), and the high end of the range represented a condition where the noise emission from each generator is 61.3 dBA at 50 feet (the highest of the measured noise levels at any direction around a generator).

Table 9 shows the modeled nighttime noise levels, compared to the allowable nighttime noise limits specified by the County noise ordinance (defined by the quietest hourly nighttime background levels). Without any noise mitigation other than the existing acoustical retrofits to each of the generators, the modeled noise levels at all receivers (including the compliance point at the residential property easement on the north side of Valley Center Road) are below measured background levels. Furthermore, the modeled noise level at the nearest house (Receiver R-1) is almost within the 47.5 dBA County noise limit that would apply even if the high background noise levels were not considered. Based on the modeled results, noise produced by the existing generators is considered less-than-significant, and no additional noise mitigation is warranted for the temporary generators. Specifically, the plywood noise enclosures that were originally proposed in Jones & Stokes' noise technical memorandum dated December 30, 2005, are not required to satisfy County noise limits.

Table 9. Guard Shack Air Conditioner Noise and Temporary Diesel Generator Noise (No Special Noise Enclosures on Generators)

Receiver	Nighttime Noise Level (dBA, Hourly Leq)			
	Quietest Nighttime Background at Innermost Easement Boundary	**Window Air Conditioner Noise [1]**	**Range of Generator Noise; No Enclosures; Hard Ground[2]**	**Range of Generator Noise; No Enclosures; Soft Ground [2]**
R1 - Western house across Valley Center Road	62	22	51–54	46–49
R2 - Commercial business across Valley Center Road	62	20	47–50	43–46
R3 - Outdoor basketball courts closest to parking lot	Not analyzed	18	49–52	48–51
R4 - School classrooms closest to parking lot	Not analyzed	12	43–46	39–42
R-5 - Inner easement boundary at Lake Wohlford Road	61	19	47–50	42–45
R-6. Inner easement boundary at south side of Valley Center Road, closest to temporary generator	65	28	58–61	53–56
R-7 - Easement boundary at north side of Valley Center Road	65	25	54–57	49–52
R-8 - Southern boundary receiver near School Bus Road	52	18	50–53	47–50

Notes:

1. Window air conditioner noise assumes a source level of 54 dBA at a 5-foot reference distance

2. Generator noise modeling assumes simultaneous operation of 4 generators, each with a range of noise source emission levels at 50 feet: 57.9 dBA (average condition) and 61.3 dBA (worst case)

3. Allowable nighttime noise limit at property boundary = lowest nighttime background (65 dBA at easement boundary along Valley Center Road and 61 dBA at easement boundary along Lake Wohlford Road)

Daytime Noise Impacts at Nearest Classrooms

Policy 4b of the County Noise Element specifies that no development shall be allowed to cause noise levels inside a school classroom to exceeding 50 dBA. As described in this section the modeled noise levels caused by the proposed project are less than that impact threshold.

Modeled outdoor daytime noise levels at Receiver R-4 (classrooms nearest the parking lot) are as follows:

Parking lot noise (FTA spreadsheet)	29 dBA Leq
Temporary Generators	43 dBA Leq
Vehicles on School Bus Road	52 dBA Leq
Combined Noise Levels	53 dBA (Leq Outdoor)

The combined outdoor noise level is 53 dBA. According to the County Noise Element (Table D-1, Sound Insulation Factors by Building Type and Window Conditions), the school building would be expected to provide 10 dBA of outdoor-to-indoor noise reduction even with the windows open. In that case the maximum hourly indoor noise level caused by the parking lot and the temporary generators would be no more than 43 dBA. The noise impact would be less-than-significant compared to the 50 dBA acceptable level.

Mitigation of Generator Noise: Plywood Noise Enclosures

Jones & Stokes' original Noise Technical Memorandum proposed constructing plywood noise enclosures around some of the temporary generators to achieve County noise limits at the facility boundary. However, based on the applicant's re-design of the facility and based on the results of the baseline noise monitoring, the acoustical insulation already retrofitted onto the existing generators noise is adequate to meet all County noise limits. Therefore, the plywood noise enclosures are not warranted as additional noise mitigation.

Guard Shack Air Conditioner Noise Impacts

As listed in Table 9, noise levels at the closest facility boundary would be less than background, so air conditioner noise impacts would be less-than-significant. For purposes of estimating noise impacts, the air conditioner was assumed to be the equivalent of a 7,000 Btu/hour LG Electronics Model LWHD7000HR window-mounted unit. The manufacturer of that unit indicates a source noise emission level of 54 dBA at a 5-foot reference distance. A specification sheet for the air conditioner is provided in Appendix G. It was assumed the air conditioner could operate for 24 hours per day.

Noise levels at the modeling receivers were estimated based on a conservative " 6 dB per doubling" calculation, without accounting for either ground attenuation or barrier attenuation provided by the guard shack structure. The modeled noise levels at the closest facility boundary (R-6, the innermost easement along Valley Center Road) and at the receivers outside the facility boundary are much lower than background. Therefore, noise impacts from the air conditioner would satisfy County noise limits and would be less-than-significant.

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